at different dates is indicated by various colours. The material for the account of the fossil forms, namely, *Bison latifrons* and *B. antiquus*, was obtained by Mr. N. S. Shaler, the Director of the Kentucky Geological Survey during 1868 and 1869, at Big Bone Lick. Independent of its scientific interest the description of the chase and rapid diminution of the existing animal will be found well worthy of perusal.

COLORATION OF WATER BY SALPÆ.—Coral reefs, as is well known, give a greenish appearance to the surrounding water when they do not lie far below the surface of the sea. The captains of merchant-vessels are accustomed to report the observation of such spots in the ocean when they are not marked on the charts. It has, however, frequently occurred, that subsequent navigators are entirely unable to find at such points any trace of hidden reefs. Baron von Schleinitz, commander of the German vessel *Gazelle*, in the report on his late exploring expedition, mentions that he encountered ten such places in the meridian 177° E. and 31° S. The lead was sunk to distances varying from 400 to 600 feet, at all these places, without reaching bottom. The green water presented an appearance as if an oily liquid was constantly rising to the surface, and a quantity of it was secured for examination. Investigation showed the cause of the phenomenon to be the presence of a great number of small, transparent, spherical salpæ. These were joined together in double rows of seven each, and by simultaneous expansion and contraction maintained a regular and comparatively rapid motion.

THE EVOLUTION OF THE CAMELIDÆ.—Prof. Cope traces an acceleration of the process of ossification of the cannon bones in Camelidæ, by which the three constituent metapodials become united at earlier and earlier periods of life. In the oldest genus, Poëbrotherium, these bones are permanently distinct; they are long distinct in Procamelus; and in Auchenia the bones are united before birth. There has been a concurrent reduction of the incisor teeth. In the Soap Fork genus Protolabis the three superior incisors persisted throughout life. In *Procamelus occidentalis* the second of these teeth persisted without being protruded till nearly adult age; the first incisor was very small, and, with its alveolus, was early removed. In the existing Camelidæ the second incisor disappears in the same way. In ruminants other than Camelidæ the third or external incisor has undergone the same process, while in the Bovidæ the canines have also been atrophied.

SELF-FERTILISATION OF PLANTS.—Mr. Thomas Meehan, continuing his observations on this subject, has found that the flower of *Campanula pulcherrima*, when confined in fine gauze bags, seeded perfectly; the method of this self-fertilisation he has not discovered. He has observed the self-fertilisation of chicory, which has rather large white pollen grains. The whole process takes about two hours. About six o'clock in the morning the pistil with closed stigmatic lobes elongates, pushing through the mass of pollen, and carrying quantities with it. About an hour after the stigmatic lobes expand, and the pollen falls into the cleft and on to the stigmatic surface. The flowers close entirely by nine or ten o'clock of the same day. No doubt pollen-eating insects visited the flowers, but when these were carefully excluded, all the flowers had pollen on their stigmatic surfaces, nevertheless. (*Proc. Acad Nat. Sci., Philadelphia*, 1876, p. 142.)

AN UNUSUAL CASE OF NATURAL SELECTION.—The usual causes for the origin and increase of secondary sexual characters do not exist among gasteropods; there is no struggling between the males for possession of the females. Mr. E. S. Morse has described (*Proc. Boston Soc. Nat. Hist.*, 1876, p. 284) a curious case in which in a limited area the shells of the males of *Buccinum undatum* scarcely equalled half the length of the female shells, and there was no doubt about their maturity. The rocky ledge on which they lived was at all times washed by impetuous currents, and the specimens of Buccinum were always found hid in nooks and concealed in cracks and crevices. Only the smallest males could work their way into such constricted quarters to the females; thus a diminution of the normal size of the male had arisen from a singular secondary sexual cause.

GELATINE IN RELATION TO NUTRITION.—Proceeding from the supposition that the processes of digestion are merely decompositions under the influence of water, which furnishes smaller and more diffusible molecules, that are afterwards compounded into the constituents of the body, M. Hermann recently (*Naturforscher*) proposed the question whether it might not be possible to employ gelatine for synthesis of albumen in the system (its decomposition products being very similar to those of albumen), merely adding tyrosin to it, the products of albumen-decomposition which are wanting. He accordingly requested M. Escher to make certain experiments on the subject. For a number of days the same food, containing gelatine but no albumen, was given to animals, and their weight and urine were determined. Then, for a similar number of days, the same amount of food was given, with a small quantity of tyrosin added, and weight and urine again determined. If the above supposition were correct, the body-weight should diminish during the first period, and the excreted urine correspond to the gelatine taken, plus some albumen of the body; in the period in which tyrosin was given, the body-weight should decrease less quickly or not at all, or even increase, and the urine be diminished so much as would correspond to the quantity of gelatine retained in the body together with tyrosin, like albumen. The experiments (nine series of them) made on pigs and dogs gave the following results:—1. Gelatine and tyrosin are absorbed in the intestine; they do not appear again in the excrement. 2. In food containing no albumen, gelatine alone cannot sustain the animal organism; the weight diminishes. 3. The same holds for tyrosin in food that is without albumen. 4. In food without albumen, gelatine and tyrosin may together sustain the organism; the weight of this remains stationary, or even increases. 5. The addition of tyrosin to food containing gelatine, but no albumen, diminishes the excretion of urine, so that less nitrogen is excreted than taken.

NOTES

NEXT month a new mineralogical journal will appear in Germany to be called *Zeitschrift für Krystallographie und Mineralogie*. The editor is Dr. Groth, Professor of Mineralogy in the University of Strassburg. The most eminent German and foreign mineralogists have promised their co-operation.

THE *Nation* states that the Trustees of the Johns Hopkins University are prepared, if convinced of the want of such a periodical, to assist in the publication of an American *Journal of Pure and Applied Mathematics*. A circular to elicit an expression of views on this subject has been issued under the signatures of Professors J. J. Sylvester, Simon Newcomb, Henry A. Rowland, and William E. Story.

MESSRS. MACMILLAN AND CO. are about to publish the first volume of a "Treatise on Chemistry" by Prof. Roscoe and Dr. Schorlemmer. The aim of the authors in this work has been to furnish a concise but at the same time complete treatise, which they hope will serve as a standard for the use of those who desire to obtain a more extended knowledge than can be derived from the various excellent smaller manuals that exist. The authors endeavour to give as complete and accurate an account as possible of purely chemical phenomena, and a clear description of the chief chemical processes. In the case of each element and of the chief compounds a short historical statement of the growth of our knowledge is prefixed to the description of their chemical properties, while in all cases of importance references to original memoirs are given. Special care has been bestowed upon the illustrations.

THE following are the arrangements for the Friday evening lectures at the Royal Institution:—January 19, Prof. Tyndall, LL.D., F.R.S., M.R.I.; January 26, Prof. Huxley, LL.D., F.R.S.; February 2, Prof. Osborne Reynolds, "Vortex Motion;" February 9, Francis Galton, F.R.S., M.R.I., "Typical Laws of Heredity;" February 16, Prof. F. Guthrie, F.R.S., "Solid Water;" February 23, J. F. Moulton; March 2, Sir John Lubbock, Bt., M.P., F.R.S., M.R.I., "Ants;" March 9, Frederick J. Bramwell, F.R.S., M.R.I.; March 16; March 23, Prof. Gladstone, Ph.D., F.R.S., M.R.I.

M. LEVERRIER is setting up, at the door of the Paris Observatory, a public clock for the use of clock-makers, who have been in the habit of calling at a special room to see a chronometer regulated for their use. He has also issued a circular announcing that every commune which purchases a public aneroid barometer, places it for inspection in a public building, and enters into an engagement to send regularly weather telegrams, will receive warnings, either directly from the Observatory, or through a departmental office established in each chief centre.

A LARGE aneroid barometer has been placed in the most prominent part of the Paris Halles for the use of the country people who come daily to sell their garden produce. The dial is 1 metre 50 in diameter, and is lighted at night.

AT the last meeting of the Netherlands Zoological Association (held on Saturday, November 18, in the Zoological Garden of Rotterdam) the Committee of the Transportable Zoological Station (see NATURE, vol. xv., p. 118) presented their first annual report, which was received with enthusiasm by the members of the Association, and will be printed in its *Bulletin*. Next year Flushing will see the station erected in its neighbourhood. With the addition of a fourth member, the Committee of the past year was re-elected for the year 1877, and consists now of Prof. Hoffmann (Leiden University), Dr. Hock (Assistant at the Leiden Zootomical Laboratory), Dr. Hubrecht (Conservator Leiden Natural History Museum), and Dr. Horst (Assistant at the Utrecht Zootomical Laboratory).

NO less than twenty-nine medical men have been elected members of the French Chamber of Deputies, and seven members of the Senate. One of these, Dr. Henry Liouville, suggested the establishment of an extra Parliamentary Conference of all his colleagues. The idea was carried into execution, and the conference of medical legislators has produced much useful work. Various important bills have been already prepared and presented to the Chamber of Deputies by these medical members. The object of the Conference is merely to deliberate upon medical matters, all political subjects being excluded. Members of all parties are admitted if they belong to the medical profession. The meetings of the Medical Conference are held weekly at the residence of Dr. Henry Liouville.

A PARISIAN optician recently commenced to observe daily the exact times at which a radiometer in his shop began and ceased to rotate. The results are published daily in the *Temps*, and although different radiometers cannot well be compared with each other, these results are already interesting. Since December 1, when the first notice was published, the radiometer stopped twice entirely during the daytime—on the 8th, during a thunderstorm, which lasted from 1.30 to 3 P.M., and on the 13th, from 10 to 10.45 A.M., during an obscuration produced by fogs. The exact time of the first move varies from 8.15 to 10.25 A.M. according to the purity of the atmosphere. The time of stopping is far less irregular, having varied only from 3.30 to 4 P.M.

THE hall in which the Academy of Sciences meets seems to be one of the worst ventilated rooms in Paris. If the windows are closed the members are stifled with heat and foul air, and many of the members have a horror of open windows. An illustrious physiologist is specially remarkable for his aversion to a current of fresh air. At a recent sitting the following colloquy on this subject occurred:—"M. Bouley: Nous sommes plongés dans un air irrespirable; ce n'est pas tenable; et, au lieu du gaz, je désire qu'on nous rende les anciennes bougies. M. Leverrier: J'ai réclamé l'éclairage par le gaz; mais j'avais réclamé aussi un autre mode d'aération. Or, rien n'a été changé sous ce rapport. Cependant nous avons le général Morin, et en huit jours des appareils convenables de ventilation seraient installés, si l'on voulait. M. Morin: Ah! en huit jours! Il y a dix ans que leur installation est décidée en principe!!! M. Leverrier: L'état actuel est vraiment honteux! Il n'y a pas de salle aussi mal ventilée que la *salle de l'Institut!*" If M. Leverrier would enter the meeting-room in the magnificent new buildings of the Royal Society during a meeting of that learned body, perhaps he would be inclined to modify his statement. It is a curious commentary on the progress of science that in Paris and London the most unscientifically constructed buildings are those in which the leaders of science carry on their deliberations.

BARON VON HOFMANN, president of the Oriental Museum in Vienna, has received a letter from the Austro-Hungarian Consul at Khartoum giving some details of the travels of Emin Effendi (Dr. Schnitzer). He has visited Uganda, Usoga, and Unyora, and stayed for some time with King Mtesa, whom he speaks of as a most wonderful man, with a considerable proportion of Abyssinian blood in his veins. This mixture of Abyssinian and negro blood Dr. Schnitzer is inclined to think accounts for the varied traits of character which travellers tell us Mtesa exhibits. He speaks of him as a man of high intelligence, but like all negroes, a child with tiger instincts; his liking for Christianity may possibly be an outcome of his Abyssinian blood. Dr. Schnitzer states that if he gets safely to the end of his journey through Nasindi, Magango, over the lake to Duffla and Lado, he will set about the arrangement for publication of his well-filled diaries. Dr. Noll of Frankfort will publish the zoological results of his travels.

A COMMISSION for the investigation of the possibility of making a canal across the Isthmus of Darien, left St. Nazaire last month. If their report is favourable it is stated that the work will be commenced next year.

A SPECIAL society for sending a scientific and commercial expedition to the unexplored parts of Asia is about to be formed at St. Petersburg.

MR. WILLIAM JOLLY, H.M. Inspector, has reprinted the paper he read at the B.A. Glasgow Meeting, on Physical Education and Hygiene in Schools. Kempster and Co., London, are the publishers.

IN the last session of the Berlin Anthropological Society Prof. Virchow presented a communication from Dr. Maclay on the results of his journey through the Malay peninsula. In his zigzag course through the mountainous region he repeatedly encountered savage tribes, displaying many points of resemblance with the Nigritos of the Philippine Islands. Two very interesting physical peculiarities of these savages attracted the traveller's attention. The first was the unusually prominent development of the so-called third eye-lid, a feature by no means uncommon among many families of animals; and the second a remarkable inclination sidewards of the three outer toes. This latter peculiarity has been noticed in several members of the ape family. In the course of his trip Dr. Maclay reached what he regarded as the highest mountain of the peninsula. At its foot he found the most numerous remains of the prehistoric Milanesian inhabitants, and encountered the dreaded "Bru," an ape above the human size. His accounts possess a special interest, as they supply the first accurate description of what are probably the only continental representatives of the insular tribes of the Malay Archipelago. Prof. Virchow exhibited also a bronze three-wheel vehicle, excavated near the River Spree, which was ornamented with oxen heads and birds. Among a large number of anthropological objects shown to the Society were a collection of outlines of the feet of negroes on the Loango coast, showing in the most striking manner, by comparison, with the feet of Europeans, the crippling effects of modern costume.

THE South African Exhibition is to be opened at Cape Town on March 15, 1877. We believe that Messrs. R. S. Newall and Co., the well-known lightning-conductor manufacturers, have received the contract for supplying their copper-rope lightning-conductors to the buildings.

A MEETING was recently held in Birmingham of the Council in conection with the projected aquarium for that town. We are glad to see that the arrangements for carrying the scheme into execution are well forward, and a Committee was appointed at the meeting to make all necessary preliminary arrangements. The proposed plan of the aquarium seems to us all that could be desired, and we are glad to see that Mr. Hughes, and other speakers at the above meeting, showed a laudable desire to make the institution serve important educational purposes; we hope, at least, that it will not degenerate into a second-rate music-hall and miscellaneous rendezvous.

THE French government established many years ago at Athens a school to which pupils are sent yearly at its expense, to study, *in situ*, Greek archæology. M. Jules Simon, when Minister of Public Instruction, established a similar school at Rome, for Italian archæology. Both have been highly successful. The number of works sent to France by them has been so great that it was stated at the last sitting of the Academy des Inscriptions et Belles Lettres, that M. Waddington has determined to issue a special periodical to be called *Annals of Archæology* in order to publish the contributions of the Fellows of the schools and of other French archæologists.

A CORRESPONDENT writes that on Wednesday, about ten minutes to 5 P.M., while at Blackwater, near Yorktown, Hants, he suddenly saw, not sixty yards off, what appeared to be a small ball of fire falling from the heavens. It was of a pale yellow colour at first, changing to a lovely bluish green; then, as it approached nearer to the earth, it became brilliant red, with a tail of fire of the colour already mentioned; and finally, when about a yard from the ground, it seemed to go out. There was no explosion, no hissing sound. There were thin clouds in the sky at the time, but no wind; and very few stars had come out. It shortly became too dark to ascertain if any body had actually fallen, or if the exploding carbon, or whatever it may have been, had left any mark on the grass, which was partly under water. Several friends had noticed an aërolite proceeding from north to south in the direction of our correspondent's post, about the time when he saw the fire-ball fall.

THE intensity, colour, and polarisation of the diffuse light of the sky in different parts has recently been a subject of study by M. Wild, of the St. Petersburg Academy, who has endeavoured to measure it with a somewhat complicated instrument devised by him and named a "uranophotometer." Referring to the Academy's *Bulletin* for the account of this instrument, we may here give briefly the results at which M. Wild has arrived:—1. Proceeding from the sun in a vertical circle northwards, it is found that the colour of the light gradually changes from the red end of the spectrum towards the violet, and at about 80° distance from the sun, it reaches about midway between the Fraunhofer lines C and D (corresponding to a wave-length of 0·000628 mm.); from there on to the horizon the colour gradually goes back towards the red end of the spectrum. Thus, in St. Petersburg at the time of equinox, the sun having about 60° zenith distance, the colour tone of the diffuse light at 80° angular distance (in a vertical circle) is mostly pure blue, and passes on either side into green. 2. The saturation of the colour appears to reach its maximum at 90° distance from the sun; where also the degree of polarisation is a maximum. On either side of this maximum the degree both of polarisation and of saturation of colour decreases pretty regularly. 3. The intensity of the diffuse reflected light of the sky appears, on the other hand, to be at its least at about 80° distance from the sun, and from there it increases less quickly towards the horizon than towards the sun. Thus, while at 140° distance from the sun the intensity is about five times greater than at 80°, at 20° distance it is over seven times greater. Southwards from the sun the intensity is considerably greater than northwards for the same distance. Thus, at 20° distance southwards it is nearly twice as great as the same distance northwards. These researches are being further prosecuted by the author.

THE "photography of tones" has been accomplished by Dr. Stein in a way which he describes in *Poggendorff's Annalen* (No. 9, 1876). One variety of his method consists in fixing a tuning-fork horizontally with its branches in vertical planes; there is a hole bored through the upper branch and a horizontal beam of light of somewhat larger section than the hole is directed on this from a heliostat. Part of the beam passes through to a sensitised plate in a case, which plate is made to move rapidly in a horizontal direction by means of a spring, or the like. Thus the luminous circle (on the plate) which, when the fork is vibrated and the plate at rest, gives a vertical line, gives a horizontal sinuous line when the plate is put in motion. The rate of motion of the plate being fixed, there will be a different number of undulations in a given space for each fork of different pitch. The curve has some interesting features; thus, it is much brighter at the bends than at the intermediate parts, the motion having been slower at the points of turning. The gradual retardation and acceleration are clearly shown. Dr. Stein finds it possible to photograph all ordinary musical tones, and even those vibrations which are above the upper limit of audition. He applies his method to strings also; fixing on these, with light supports, small square discs of blackened mica with a hole for admission of the light. Several cords in a row may have their periods photographed together on the same plate, the mica discs rising one above another.

THE additions to the Zoological Society's Gardens during the past week include a Sykes's Monkey (*Cercopithecus albogularis*) from West Africa, presented by Mr. R. Payne; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mr. Thos. Mash; a Rhesus Monkey (*Macacus erythræus*) from India, presented by Mr. J. H. Ivory; a Hoffmann's Sloth (*Cholopus hoffmanni*) from Panama, presented by Mr. L. R. Dickinson; a Silver-backed Fox (*Canis chama*) from South Africa, presented by Mr. Richard Ladd; a Common Paradoxure (*Paradoxurus typus*) from Bengal, presented by Dr. J. B. Wilson; a Black-headed Gull (*Larus ridibundus*), European, presented by Mr. James Smart; two Jardine's Parrots (*Pœocephalus gulielmi*) from West Africa, two Indian Robins (*Geocichla citrina*), two Red-crowned Jay Thrushes (*Garrulax ruficeps*), a Horsfield's Mountain Thrush (*Mycophoneus horsfieldi*) from India, purchased; a Red Coati (*Nasua nasica*) from South America, seven Double-spurred Francolines (*Francolinus bicalcaratus*) from West Africa, deposited.